

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

November 7, 2003

TO: Internal File

THRU: Joe Helfrich, Team Lead

FROM: James D. Smith, Environmental Scientist

RE: South Crandall Lease Revision, Andalex Resources, Inc., Crandall Canyon Mine, C/015/0032, Task # 1698

SUMMARY:

Little Bear Spring in Little Bear Canyon, located adjacent to the South Crandall Canyon Tract, is an important source of water for the Castle Valley Special Services District (CVSSD), supplying 65 percent of the culinary water to the residents of Huntington, Cleveland, and Elmo. It is probably the largest and most consistently flowing spring in the region, and the only water-treatment required before use is chlorination. CVSSD has great concerns about protecting this important water supply from mining related damage. The South Crandall Canyon Coal Lease Tract was deleted from the Mill Fork Tract because of concerns that were raised regarding Little Bear Spring.

The South Crandall Canyon area was reevaluated and was leased to Andalex in June 2003 (lease UTU-78953). Access to the South Crandall Canyon Tract will be through new portals (under construction in 2003) on the south side of Crandall Canyon in fee coal (often referred to as the "Dellenbach" lease) owned by IPA and Andalex. The South Crandall Canyon Tract covers 880 acres.

The proposed amendment should not be approved at this time. Additional geologic and hydrologic information are needed to meet the requirements of the Coal Mining Rules and for the Division to upgrade of the CHIA.

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TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

There is geologic information for the permit and adjacent areas in the current MRP; however, geologic information for the South Crandall Canyon Tract is not sufficient to meet the requirements of the Coal Mining Rules or for the Division to update the CHIA. Some of this needed information may be in the appendices that were submitted as part of the amendment, but the MRP needs to incorporate or clearly reference information that addresses the requirements of the Coal Mining Rules. All geologic maps need to be updated to include the South Crandall Canyon Tract.

The lowest coal seam in the Blackhawk Formation is the Hiawatha, characteristically lying on or just above the Star Point Sandstone. This seam has been mined in the Cottonwood/Wilberg, Deer Creek, Des-Bee-Dove, Huntington #4, and Genwal Mines. The Hiawatha Seam thins to less than 5 feet in the north end of the Cottonwood/Wilberg Mine, but then thickens again to the north. The Hiawatha Seam reaches a thickness of 12 feet in the current permit area of the Crandall Canyon Mine, located mainly north and west of the mine pad, but thickness information for the South Crandall Canyon has not been submitted to the Division.

The Blind Canyon Seam lies approximately 40 to 100 feet above the Hiawatha Seam. The Blind Canyon Seam has been mined in the Deer Creek, Huntington #4, and Des-Bee-Dove Mines, but is too thin to mine economically at the Cottonwood/Wilberg Mines. The Blind Canyon Seam is too thin for economic recovery in the current permit area of the Crandall Canyon Mine, but this seam will be mined in the South Crandall Canyon Tract; however, thickness information for the South Crandall Canyon has not been submitted to the Division.

The Permittee needs to clarify that the Blind Canyon Seam is mineable in the South Crandall Canyon Tract. On page 6-5 of the proposed amendment is the statement that "Except for the South Crandall lease there are no reserves considered mineable or recoverable in the upper seams (Plates 6-4 and 6-5). The Hiawatha seam is the only seam in the mine plan area that

is of mineable thickness.” These two sentences are unclear and appear to contradict each other. Drilling data discussed on page 6-5 in the MRP indicate the Blind Canyon Seam is not thick enough to be economically recoverable, and a similar statement is made on page 6-4: the Permittee needs to check the entire application for such contradictory or confusing language.

The Permittee asserts that the Bear Canyon Seam is not mineable anywhere in the Crandall Canyon Mine permit area, but data for the South Crandall Canyon Tract are not presented.

The Permittee needs to provide test-boring or drill-log information for the South Crandall Canyon Tract and show the locations of the boreholes on a map.

The Permittee needs to provide sufficient geologic information to evaluate the subsidence control plan for the South Crandall Canyon Tract - including at a minimum but not limited to the thickness of the coal seams and thickness and lithology of the overburden, and interburden.

Acid and toxic forming characteristics for the Hiawatha coal are discussed on page 6-9. The Permittee needs to provide analyses for acid- and toxic-forming characteristics for the Blind Canyon Seam and over- and underburden.

Information on clays or soft rock in strata immediately above the seams to be mined is discussed in section 6.24.34, which make reference to Appendices 6-1 and 6-5. However, it is not clear that the properties of strata above the Blind Canyon Seam have been evaluated, nor that properties for strata adjacent to the Hiawatha Seam in the South Crandall Canyon Tract have been evaluated. The Permittee needs to provide engineering properties of roof and floor rock for the Blind Canyon and Hiawatha Seams in the South Crandall Canyon Tract.

Little Bear Spring is located adjacent to the South Crandall Canyon Tract, and CVSSD has great concerns about protecting this important water supply from mining related damage. The Permittee needs to discuss the occurrence of subsurface water or aquifers in the South Crandall Canyon Tract. The Permittee needs to provide information on how geology may affect the occurrence, availability, movement, quantity and quality of potentially impacted surface and ground water in the South Crandall Canyon Tract and adjacent areas.

The geologic and hydrologic information submitted is insufficient for the Division to update the CHIA.

Findings:

Geologic Resource Information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

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R645-301-121.220, the Permittee needs to clarify that the Blind Canyon Seam is mineable in the South Crandall Canyon Tract. Statements on pages 6-4 and 6-5 about the minability of the Blind Canyon Seam are unclear and appear to contradict each other: the Permittee needs to check the entire application for such contradictory or confusing language.

R645-301-622.200, -624.310, the Permittee needs to provide drill-hole logs and other information on the nature, depth, and thickness of the Hiawatha, Blind Canyon, and Bear Canyon Seams in the South Crandall Canyon Tract.

R645-301-624.310, the Permittee needs to provide drill-hole logs showing the lithologic characteristics, including physical properties and thickness, of overburden, and also the location and depth of any ground water that was encountered.

R645-301-624.320, -624.330, -623.100, the Permittee needs to provide analyses for acid- and toxic-forming characteristics for the Blind Canyon Seam and over- and underburden.

R645-301-624.340, the Permittee needs to provide engineering properties of roof and floor rock for the Blind Canyon and Hiawatha Seams in the South Crandall Canyon Tract.

R645-301-623.300, -627, the Permittee needs to provide sufficient geologic information to evaluate the subsidence control plan for the South Crandall Canyon Tract - including at a minimum but not limited to the thickness of the coal seams and thickness and lithology of the overburden and interburden.

R645-301-624.100, the Permittee needs to discuss the geology and occurrence of subsurface water or aquifers in and adjacent to the South Crandall Canyon Tract, and how geology may affect the occurrence, availability, movement, quantity and quality of potentially impacted surface and ground water in the South Crandall Canyon Tract and adjacent areas.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline Cumulative Impact Area Information

The Division needs to update the East Mountain CHIA to incorporate the expansion of the Crandall Canyon Mine into the South Crandall Canyon Lease Tract. Additional geologic and hydrologic information, as described in Findings of other sections of this document, are needed before the Division can complete this update.

Findings:

Baseline cumulative impact information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

R645-301-725.100, the Permittee needs to provide geologic and hydrologic information as described in the Findings of other sections.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

All the Chapter 6 maps need to be updated to show the boundary for the South Crandall Canyon Tract.

Coal Resource and Geologic Information Maps

Map 6-2 needs to include subsidence projections for the South Crandall Canyon Tract.

The Hiawatha Seam thickness isopach (Plate 6-3), the Blind Canyon Seam thickness isopach (Plate 6-4), and Bear Canyon Seam thickness isopach (Plate 6-5), Hiawatha Seam overburden thickness isopach (Plate 6-6), and structure contour map of the top of the Hiawatha

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Seam (Plate 6-7) need to be expanded to include the South Crandall Canyon Tract and adjacent areas.

A map showing Blind Canyon to Hiawatha interburden thickness needs to be added to the South Crandall Lease Revision.

The thickness of the Blind Canyon overburden is very close to that over the Hiawatha Seam. Taking into consideration the inherent inaccuracy in the large contour interval needed to map the overburden thickness because of the steep topography, the difference between the Hiawatha and Bear Canyon overburden thicknesses is not significant, so an additional map showing the Blind Canyon Seam overburden thickness is not really needed. Similarly, a structure map of the Blind Canyon Seam is not needed. However, reasons these maps are not in the MRP need to be discussed.

Monitoring and Sampling Location Maps

Maps need to show the locations of test borings in the South Crandall Canyon Tract.

Findings:

Maps, plans, and cross sections of resource information are not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

R645-301-622.100, the Permittee needs to show the locations of test borings in the South Crandall Canyon Tract on maps.

R645-301-622.200, the Permittee needs to add a map showing Blind Canyon to Hiawatha interburden thickness for the South Crandall Lease Revision.

R645-301-622.200, the Permittee needs to include the South Crandall Canyon Tract on Plates 6-3, 6-4, 6-5, 6-6, and 6-7 to show the nature, depth, and thickness of the Hiawatha, Blind Canyon, and Bear Canyon Seams, and the overburden.

R645-301-632, the Permittee needs to include subsidence projections for the South Crandall Canyon Tract on Plate 6-2.

R645-301-622.200, -627, the Permittee needs to either include an overburden thickness isopach map and structure map for the Blind Canyon Seam or explain why there is no need for these maps.

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Subsidence Control Plan

Map 6-2 needs to include subsidence projections for the South Crandall Canyon Tract.

Findings:

Subsidence Control information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

R645-301-632, the Permittee needs to provide subsidence projections for the South Crandall Canyon Tract.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Plans for casing and sealing holes are covered in the current MRP, but locations of the holes in the South Crandall Canyon Tract are unknown.

Findings:

Mine Opening information is not sufficient to meet the requirements of the Coal Mining Rules. Before the proposed amendment can be approved, the Permittee needs to provide the following information:

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R645-301-622.100, show on maps the locations of boreholes in the South Crandall Canyon Lease Tract.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The Division needs to update the East Mountain CHIA to incorporate the expansion of the Crandall Canyon Mine into the South Crandall Canyon Lease Tract. Additional geologic and hydrologic information, as described in the Findings of other sections of this document, are needed before the Division can complete this update.

Findings:

The Division cannot complete the CHIA at this time.

R645-301-725.100, the Permittee needs to provide geologic and hydrologic information as described in the Findings of other sections.

RECOMMENDATIONS:

The proposed amendment should not be approved at this time. Additional geologic and hydrologic information are needed to meet the requirements of the Coal Mining Rules.